Gerry E. Studds Stellwagen Bank National Marine Sanctuary
Site Characterization Working Group Summary

Overview

Unlike the rest of the Working Groups (WG), the goal of this WG was not to produce an Action Plan but rather to: (1) identify existing datasets that may help characterize sanctuary resources; (2) to identify data gaps, and (3) support other WGs in their quest for data. The WG met once on August 5, 2003. Further meetings of the WG were not necessary given the tight timeline of the other working groups and because the sanctuary staff were able to provide the data support that the other working groups required.

Background and Regional Context

The public comment scoping process conducted by Stellwagen Bank National Marine Sanctuary (SBNMS) in 1998, and again in 2002, identified several concerns relative to the site characterization and the assessment of resource status at SBNMS. Concerns in this regard included the need for a comprehensive research plan, the implementation of a research closure in the sanctuary, the lack of a comprehensive monitoring program to determine baselines and/or to recognize changes in the SBNMS ecosystem, and a comprehensive socio-economic analysis of the value of SBNMS resources.

There is a great deal of existing scientific and economic data on the types of biological, physical and economic resources that occur within the Gulf of Maine (GOM) and on Georges Bank (GB), as well as on the human activities that occur there. These data are of varying quality, are available at a range of spatial and temporal scales, and cover a multitude of taxa (such as fishes, marine mammals, invertebrates and seabirds) and activities (such as fishing, whale watching, and waste disposal). Many of these data either encompass some or all of the Sanctuary, or cover other areas but include resources or activities that also occur in the Sanctuary. However, there are very few datasets that were explicitly collected at the scale of the sanctuary, or that were collected to explicitly address questions relative to the sanctuary.

An initial site characterization, entitled “The Resources and Uses of Stellwagen Bank,” was prepared at a regional conference in 1990. The information provided in this original characterization is largely of the inventory type described above. A Sanctuary Research Plan was developed during public meetings in 1994. The plan was subsequently revised in 1997. The Plan identified specific topics of import to the sanctuary and enumerated research projects to address those topics. While new data have become available since the original site characterization and since the revision of the research plan, the specific elements of the plan are still largely applicable to the sanctuary in the present. In 1995, a book entitled “Stellwagen Bank: A Guide to the Whales, Seabirds, and Marine Life of the Stellwagen Bank National Marine Sanctuary” was published that provided an overview of the diverse taxa that occur in the sanctuary and ecological relationships among them.

Issues Addressed

Two issues emerged from the public scoping comments regarding site characterization:

- More detailed site characterization and assessment of resource status
- Need for more information on habits and habitat use of the sanctuary by whales and other marine mammals.

Working Group Recommendations

The WG acknowledged and discussed the existence of the following spatial data archived by the SBNMS in its Geographic Information System (GIS):

Table 1: SBNMS GIS Spatial Data

FIGURE	MAP	DATA LAYER DESCRIPTION
1	Bathymetry	Bathymetry 15m Contours
2	Bathygrid & Hillshade	Bathygrid & Hillshade Relief
3	Multibeam Backscatter	Backscatter Multibeam & Hillsahde Relief
4	Sediment Map	Mud, Sand, Gravel Reclassified Grid
5	Sediment & Depth	Sediment Cross-Classified By Depth
6	Massachusetts Bay Disturbance Map	Depositional, Erosional, Sediment Reworking
7	Gulf of Maine Ocean Observing System (GOMOOS) Buoy Site	Massachusetts Bay A0106
8	Massachusetts Water Resources Authority (MWRA) Dtations	Active and Historic Sites
9	Massachusetts Bay Disposal Site (MBDS)	Buoys and General Area Circle
10	Water Quality Stations	Four Water Quality Sites
11	Beam Trawl Stations	1995-98 Beam Trawl Stations
12	National Oceanic Atmospheric Administration (NOAA) Fisheries juvenile survey	2000 Beam Trawls
13	Seafloor Habitat Recovery Monitoring Program (SHRMP) Stations	Multibeam Backscatter & the P32S Remotely Operated Vehicle (ROV)/Integrated Seafloor Imaging Systems (ISIS) Divestarts
14	Cod Movement Stations	Acoustic Hydrophones
15	Structure Forming Invertebrates	Sampling Methods by Site (Jud Crawford)
16	20-year Humpback Animation	Humpback Whales (all quantities)
17	20-Year 3-D Histogram	Humpback Whales (all quantities)
18	Track Lines	Survey Track Lines
19	Right Whales Consortium	Sightings from All Years

20	Shipping Tracks	Mandatory Ship Reporting System (July 1999-Jone 2000)
21	Baleen Whales	Yearly and Seasonal Comparisons 1994/95 & 2001/02
22	Fixed Gear	Yearly and Seasonal Comparisons 1994/95 & 2001/02
23	Mobile Vessels	Yearly and Seasonal Comparisons 1994/95 & 2001/02
24	Closures	Fishing Regulation Closures
25	Wreck Database	Potential Wreck Targets Over Bathymetry

The WG made the following suggestions for additional site characterization data, some of which were obtained after the meeting:

DATA TYPE	SUGGESTED BY	POTENTIAL CONTACT
GEOLOGICAL DATA		
Seismic data from oil and natural gas exploration	Dave Lincoln	USGS (may have paper map); also look in Georges Bank Book
Multibeam sonar surveys on western side of Stellwagen Bank	Tony Wilbur	Coastal Zone Management (CZM); National Ocean Service (NOS); USGS (fieldwork to begin in Fall 2003)
Jeffreys Ledge backscatter mapping	Page Valentine	Larry Meyer (University of New Hampshire (UNH/NOAA Mapping Consortium)
Terrain ruggedness index	Page Valentine	Page Valentine (available Fall 2003)
NOAA Fisheries "hang" database	Jason Link	Jason Link (already sent to SBNMS)
Sediment samples (heavy metals, etc.) (Gloucester Fishermen's Wives Association [GWFA]/Northeast [NE] consort work)	Dave Lincoln	Dave Lincoln; U.S. Army Corps of Engineers (USACE)
Mass Bay/nearshore bathymetry	Tony Wilbur	Tony Wilbur/USGS
Disposal site monitoring data (sediment profile imagery, benthic grabs)	Tony Wilbur	Tom Fredette (USACE); Environmental Protection Agency (EPA)
Hazardous materials (HAZMAT) transport data		
U.S. Geological Service (USGS) dumpsite map	Page Valentine	Page Valentine
Aeromagnetic/gravity data (related to nuclear power plant siting)	Dave Lincoln	
FISHERIES DATA		
Data on fish spawning sites	Various	?
Fishermens' oral history	Dave Lincoln	Massachusetts Institute of Technology (MIT) / Madeleine Hall Arbor
NOAA Fisheries plankton and shrimp surveys	Jason Link	Joan Palmer (NOAA Fisheries)
Recreational fishing data	Various	NMFS
Large pelagic fish data (tuna landings and values)		Mark Murray-Brown
Pelagic organisms	John Crawford	Larry Madin (Woods Hole Oceanographic Institute [WHOI])
Essential Fish Habitat (EFH) Technical Team Vessel Trip Report (VTR) data (pre-Western Gulf of Maine closure)		NOAA Fisheries (for comparison with 1995 and 2002 usage study)
Long- and short-term fisheries studies		Massachusetts Division of Marine Fisheries (MADMF)
Jellyfish–hydroid data		Larry Madin (WHOI)

OCEANOGRAPHIC DATA		
NOAA Fisheries Temperature and salinity maps; thermocline	Dave Lincoln/Jason Link	Dave Mountain (NOAA Fisheries)
Sea-viewing Wide Field of view Sensor (SeaWifs) Data	Dave Lincoln	
Water temperature data	Tony Wilbur	MADMF
Physical oceanographic data	Various	Allan Robinson (Harvard) Li (University of Maine) GOMOOS Global Ocean Ecosystems Dynamics (GLOBEC) Lynch (Dartmouth) Chris Clark (Cornell)
MWRA outfall modeling		Rocky Geyer (USGS)
SHIPPING		
New England Institute of Technology (NEIT) port economics study		Hauke Kite-Powell (WHOI)
Cruise ship data		MassPort

The WG identified the following potential data gaps:

- Fish spawning locations
- Distribution and abundance of juvenile fish
- Quantification of upstream nutrient or pollutant inputs into the sanctuary (e.g., the Merrimack River)
- Distribution of taxa in the sanctuary relative to elsewhere in the Gulf of Maine
- Quality of NMFS VTR data
- Fish life history studies/newly settled juveniles
- Habitat types (including fish behavior across types)
- Historic review of the status of sanctuary
- Data on turtle bycatch in different fishing gears
- Fuller understanding of marine mammal use of sanctuary habitat (species; time spent in the sanctuary; migration windows)
- Transform MARXAN fish data (10 minute square) to the appropriate scale
- Transform phytoplankton data (satellite imagery; chlorophyll A) and data on lobster and crab catches to the appropriate scale

Site characterization is a critical and evolving activity for the SBNMS. Through the WG process, considerable progress was made in characterizing sanctuary resources and their status. This information will be presented in the Description of the Affected Environment section of the sanctuary's management plan when that is published in 2005.